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ABSTRACT

This paper reports research on the applicability of the Wisconsin Model of adolescent educational performance and aspirations in explaining development in a sample of 3028 students enrolled in grades 8-12 in 23 public schools in Mississippi. Main and interaction effects of race and sex were examined using questionnaire data gathered in 1972. The initial analysis compared Mississippi results for white males and females with results of three other data sets: 1957 Wisconsin seniors, 1955 "Explorations in Equality of Opportunity" (EEO) sophomores, and 1964-65 High School Climate sample of tenth through twelfth graders. A second phase of analysis employing dummy variable regression assessed sex and race interaction with the variables of the model. A separate analysis for each race sex subsample was presented. Results of the comparison of these data with other data sets showed impressive consistency despite some measurement and sampling differences. The covariance analysis showed both race and sex effects to be consequential with sex effects more pronounced among whites than blacks. The race-sex group analysis showed the model to be more effective in predicting educational and occupational expectations for whites than for blacks. This difference was due primarily to the lesser dependence of expectations on beginning status among blacks than among whites. (Author)

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Race, Sex and Schooling: Insights from the "Wisconsin Model" of Early Achievement Process*

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Abstract

This paper reports research on the applicability of the Wisconsin Model of adolescent educational performance and aspirations in explaining development in a sample of 3028 students enrolled in grades 8-12 in 23 public schools in Mississippi. Main and interaction effects of race and sex are examined using questionnaire data gathered in 1972. The initial analysis compares Mississippi results for white males and females with results of three other data sets: 1957 Wisconsin seniors, 1955 EEO sophomores, and 1964-65 High School Climate sample of tenth through twelfth graders. A second phase of analysis employing dummy variable regression assesses sex and race interaction with the variables of the model. A separate analysis for each race-sex subsample is presented. Results of the comparison of these data with other data sets show impressive consistency despite some measurement and sampling differences. The covariance analysis shows both race and sex effects to be consequential, with sex effects more pronounced among whites than blacks. The race-sex group analysis shows the model to be much more effective in predicting educational and occupational expectations for whites than for blacks. This difference is due primarily to the lesser dependence of expectations on beginning status among blacks than among whites.

Introduction

The purpose of this report is to present a test of the Sewell-Hauser Wisconsin model (Sewell, Haller, and Portes, 1969; Sewell and Hauser, 1975) of adolescent educational performance and aspirations based on a sample of 3000 Mississippi school children. The original Wisconsin analyses, as well as recent extensions and elaborations (Alexander and Eckland, 1974; Alexander, Eckland, and Griffin, 1975, Wilson and Portes, 1975), have been based on white students. Moreover, the original model was estimated using data which are now almost twenty years old. Again, this is true of most multivariate modeling studies of adolescent school performance.[1] Since our sample was drawn in 1972 and is more than 30 percent black, our results should further assess the continuing utility of the Wisconsin model for unraveling the dynamics of the early achievement process (to the development of goal orientations) among recently enrolled black and white, male and female students. Through replication our results will add generality to or further specify the limits of earlier findings.

Based on the seminal work of Blau and Duncan (1967), Sewell, Haller and Portes (1969) specified and estimated

a "social psychological" model of educational and occupational status attainment. The Wisconsin model--as it is now labeled--includes academic ability, academic performance, interpersonal influences of three types of significant others, and educational plans and occupational aspirations as variables intervening between socioeconomic origins and socioeconomic achievement. These social psychological motivations and experiences, or "school process" variables, generally register small but significant effects on adult labor market successes of males as well as transmit most of the advantages or disadvantages associated with parental statuses (Sewell and Hauser, 1972; Alexander, Eckland, and Griffin, 1975). Hence, this conceptual and analytical integration of social-structural and school process variables has considerably improved our understanding of the complexities of the transmission of social inequality from generation to generation, at least among white male cohorts. Additionally, these school process and social psychological mechanisms have been shown to be important for understanding white male-white female educational and occupational achievement differences (Carter, 1972; Alexander and Eckland, 1974; Hauser, Sewell, and Alwin, 1974) and black male-white male differences in the educational and occupational status attainment process (Porter, 1974, 1976).

Although most of the analyses of the Wisconsin model

have been restricted to males (see, however, Sewell and Shah, 1967; 1968), recent extensions or variants of the model have assessed sex main and/or interaction effects (Hauser, 1972; Carter, 1972; Hauser, Sewell and Alwin, 1974; Alexander and Eckland, 1974; Alexander and McDill, 1976; Williams, 1972; 1975; Hout and Morgan, 1975). Generally, sex main effects are evidenced for several of the school process variables, and meaningful and consistent sex interactions with, especially, socioeconomic status and academic aptitude also have been reported (e.g., Alexander and Eckland, 1974; Sewell and Shah, 1967).

Unfortunately, our knowledge of the dynamics of educational performance and aspiration-formation of black males and females, or of sex differences among black youth, does not equal what is known concerning their white counterparts. This is true despite the fact that the academic performance of blacks and black-white differences in school success and ambition have been heavily researched (Bachman, 1970; Coleman, Campbell et al., 1966; Kerckhoff and Campbell, 1975; Mosteller and Moynihan, 1972; Gordon, 1972; Jencks and Brown, 1975; U.S. Civil Rights Commission, 1967; McPartland, 1967; Crain, 1971; Boardman et al., 1973). This limitation is primarily due to the shortcomings of most data sets, very few of which have the social psychological and academic performance variables necessary to replicate the Wisconsin model for black students. Porter's

(1974; 1976) recent reanalyses of the Project Talent data represent an explicit attempt to explore the differing role of achievement-related school process variables for black and white men. His analyses, however, were limited to males. Bachman's (1970) sample, too, contained only black and white males. Gordon (1972), though basing his research on the "Coleman" data, which include both boys and girls, never controlled for sex or even identified the sex composition of his subsample. Combined race-sex effects, either main or interaction, therefore generally have not been assessed in causal models of the sort discussed here (the major exception of Hout and Morgan, 1975; see below), even though the importance of such multiple ascribed statuses for adult achievements is documented (Epstein, 1973; Treiman and Terrell, 1975).

In sum, the applicability of the Wisconsin model to the schooling experiences of black students still requires assessment. Moreover, while there is a growing body of literature on sex effects in the adolescent achievement process, this research generally is limited to white students; hence, little effort has been devoted to a comprehensive analysis of race and sex differences and influences in social-psychological models of educational performance and ambition. In the only structural modeling effort to date which appraises first and second order race and sex interactions, Hout and Morgan (1975) found that

sigificant differences existed among the four groups in the processes governing the formation of career expectations. The results obtained by Hout and Morgan are limited to twelfth graders in Louisville, Kentucky; moreover, the number of blacks in their sample is rather small, 190 males and 331 females. Thus, while the study of Hout and Morgan has increased our knowledge about the stratification and socialization differences which exist between race-sex groups, further research is needed to assess the generality of their conclusions.

Since the mid-1960s public scrutiny, Supreme Court policies, and government intervention ostensibly have resulted in appreciable changes in the structure and operation of some American school systems. Remedial and experimental education programs, voluntary and involuntary busing, and other educational reforms, many directed at racial minorities, generally date from the publication of the "Coleman Report" (1966). These modifications, or other unspecified alterations in educational theory and practice over the past decade or two, conceivably may have altered the relationships among the above social-structural and social-psychological variables. While the Wisconsin model, or any of the achievement models utilized by the researchers cited above, may have accurately reflected the adolescent achievement process as it was occurring ten or twenty years ago, there is no assurance that such models still capture

the most relevant parameters of educational performance and ambition or that the relative influence of those variables included in these models has remained constant over the past two decades. Indeed, evidence presented by Wilson and Portes (1975) appears to suggest that the importance of such social psychological supports as significant others' influence has declined relative to that exercised by more "structural" variables (i.e., status backgrounds and aptitude). Finally, the continued existence of the notable sex differences (among whites) in the efficacy of status backgrounds and aptitude is an empirical question. On this point, Alexander and Eckland (1974), for example, note the time-bound nature of their results and argue for awareness of historical change in even a twenty-year period.

The Model

The Wisconsin model to be utilized here was specified by Sewell and Hauser (1972; 1975) and is presented in Figure 1. Given the nature of our sample, adult achievements cannot be considered and thus our ultimate endogenous variables are educational and occupational expectations. The Wisconsin researchers included a fourth socioeconomic status-origin indicator, parental income as obtained from Wisconsin state tax records. No such measure was available in our data, and a student-reported proxy, parental income relative to other students in school, proved

unsatisfactory and therefore was deleted from our analyses. We reanalyzed the Wisconsin (Sewell and Hauser, 1975) and the Explorations in Equality of Opportunity data (Alexander, Eckland and Griffin, 1975) deleting the parental wealth or income variable in each data set. The results showed that the upward biases in estimates of the effects of father's occupation, father's education, and mother's education on the school-process outcomes (rather than actual adult attainments) were negligible. Therefore, we do not view the absence of parental income in our data as a serious weakness.

Figure 1 here

For a detailed discussion of the rationale underlying the development of the Wisconsin model, the reader is referred to the original research reports (Sewell, Haller, and Portes, 1969; Sewell and Hauser, 1972; 1975; Hauser, 1973). The cross-sectional nature of most data sets leads to some problematic specifications of the hypothesized effects included in the model, and several researchers (e.g., Hauser, 1973; Duncan, Haller, and Portes, 1968; Hout and Morgan, 1975; Porter, 1974; 1976; Kerckhoff, 1974) have posited alternative orderings of these variables. However, the Wisconsin model appears to be solidly grounded in social-psychological theory (see especially the statements of Sewell, Haller, and Portes, 1969), none of the specifications is implausible, and the model has been

replicated with two national data sets on adolescents' school experiences (Alexander, Eckland, and Griffin, 1975; Wilson and Portes, 1975). Moveover, internal replications of the Wisconsin data suggest that the model is applicable for men from a variety of communities of origin (Sewell, Haller, and Ohlendorf, 1970). And, finally, Carter (1972) has compared the utility of the model for Wisconsin men and women, thus providing benchmark estimates of the influence of sex in school-process models of the sort discussed here. Given the theoretical and empirical support for Sewell and Hauser's formulation, it is useful to apply the Wisconsin model in assessing race and sex influences in the school process. Moreover, the generality of past findings is best evaluated by first relating new inquiries to existing knowledge before extending or modifying the model further.

Methods

Sample

In the spring of 1972 questionnaires were administered to all students enrolled in 23 northern Mississippi public schools. These schools make up seven individual school systems, three of which are rural county school districts while four are urban school districts. With the exception of two of the rural school systems, all of the districts are unitary; that is, all children of each school

grade in the district attend the same school. Though some selectivity in desegregation remains due to the emergence of private "academies," this is a significant influence in only two of the systems studied (DeBord, 1975).

Questionnaires were administered in school classrooms by members of the research team with the assistance of teachers. The instrument consisted of eight printed pages, and the average administration time was about 40 minutes, although each student was allowed as much time as needed. Absentee lists were checked, and the necessary number of questionnaires was left with the counselor for administration when these students returned to school. Several questionnaires were returned only partially completed. A check of responses indicated that this resulted largely from poor reading ability rather than lack of cooperation. As a result, our population consists of students (grades 8-12) enrolled in regular classes and reading at a level which enabled comprehension of the instrument.

In all, 7009 students were enrolled in the 23 schools at the time of the survey. Of this number, questionnaires were completed by 6596, or 94.1 percent. The remaining 5.9 percent either were rejected for the reasons stated above or did not return to school before the semester ended.

The subsample to be analyzed here consists of the

3028 students for whom complete data were available on all variables employed in the analyses. Of these students, 1014 (33.5 percent) are white males, 1025 (33.9 percent) are white females, 439 (14.5 percent) are black males, and 550 (18.2 percent) are black females. These respondents scored slightly higher on all variables included in this analysis than did the total sample. Sample attrition was primarily due to the 2116 respondents (32.3 percent of the total sample) who failed to state their occupational plans.

Measures

1. Three indicators, all based on students' reports, are employed to measure socioeconomic background: (1) Father's education (FAED) and (2) mother's education (MOED) are taken from a fixed-format item and range, on a five-point scale from eighth grade or less to college graduate. (3) Household head's occupation (OCC) is based on the student's response to an open-ended question and is coded according to Duncan's SIE scores. We use father's occupation unless the student failed to list an occupation for father; in this case, household head's occupation is mother's occupation. We estimated all regression equations to be discussed in this paper using father's occupation only rather than head's occupation in order to assess the substantive ramifications of this substitution procedure. Although the use of father's occupation resulted in

a considerable reduction in the sample size of blacks, the two occupation variables (head's and father's) "operate" essentially identically. Thus, head's occupation appears to be a reasonable indicator of the student's occupational status background. While we present the estimates of the effect of separate status origin variables, we also summarize the influence of the set of status variables by a single coefficient through a procedure discussed by Heise (1972).

We have no reliability data for the three indices of socioeconomic origins. It must be noted that student reports of parental statuses may be reasonably accurate but are nonetheless fallible measures of true parental education and occupation (Borus and Nestel, 1973; Jencks, 1972; Harper and Summers, 1973; Kerckhoff, Mason, and Poss, 1973; Mason et al., 1974; Cohen and Orum, 1972; St. John, 1970; Cook, 1976). Moreover, the work of Kerckhoff, Mason and Poss (1973), Mason et al. (1974), and St. John (1970), among others, suggests that the unreliability of blacks' reports of parental statuses is somewhat greater than those of whites.

2. Academic aptitude (APT) is based on the respondent's decile rank for the total sample's distribution of mental ability scores. These data were not available for 600 of the subsample of 3028 students; for this group, the respondent's decile ranking within the total

sample's distribution of reading achievement scores is used to estimate academic aptitudes. All test data are taken from school records. The substitution procedure is necessitated by the fact that various school systems administered different ability tests and some low SES, primarily white, systems administered achievement tests in lieu of ability tests. Our use of this procedure is based upon the assumption that both mental ability and reading achievement tap the same underlying trait, academic aptitude (see Jencks, 1972; Carver, 1975; Humphreys, 1974). The pairwise present correlation between the two variables, .72, while far from unity, is high enough to lend strong empirical support to our assumption.

In order to assess the ramifications of our missing data estimation procedure, we estimated all regression equations using mental ability (raw scores) alone. The coefficients of determination (R^2) derived from a regression of mental ability on the three socioeconomic indicators differed at most by .029 (for black females) from those presented in Table 2 and Table 4. More importantly, our substantive conclusions, based on an interpretation of all coefficients and R^2's for the remaining six endogenous variables, are the same regardless of which measure of aptitude is used.[2]

3. Academic performance (GPA) is measured by the average of all grades received by the student in social

science, English, math, and science from the fall of 1969 to the spring of 1972. These data were obtained from school records and were scored on a continuum from 0 (F) to 4 (A).

4. Teacher and counselor educational encouragement (TEACH) is a composite of the student's reports of direct encouragement or discouragement for college attendance from both teachers and counselors and is coded on a five point scale from both discourage college to both encourage college. The two items correlate between .23 and .33 for all four race-sex groups. We disaggregated this measure into its constituent parts and found that both indicators generally "operated" in a unidimensional manner. For this reason, and in order to insure comparability with past measurement strategies (Alexander and Eckland, 1974; 1975; Alexander, Eckland, and Griffin, 1975), we use the composite index throughout the paper.

5. Paternal and material influences are derived from two separate questions eliciting the student's perception of the direct degree of college encouragement or discouragement from both mother and father. The two items, which correlate approximately .62 for black males and white males and females and .46 for black females, were similarly responsive to status origins, aptitude, and academic performance within each race-sex group. Preliminary regressions indicated that maternal encouragement

registered the strongest direct effects on both educational and occupational expectations for all groups but paternal encouragement also enhanced expectations. The two influences, therefore, were summed and the composite parental encouragement index (PAR) ranges from 1 (both discourage college) to 9 (both encourage college). Sewell and his associates (Sewell, Haller, and Portes, 1969; Sewell and Hauser, 1975), Alexander and Eckland (1974; 1975; Alexander, Eckland, and Griffin, 1975), and Kerckhoff (1974) also employ global parental encouragement measures.[3]

6. Our last measure of "signficant others' influence," friends' college plans (PEER), is taken from the responses of the student's best friends (up to three) to the following question: "Which one of the following statements applies most to your future plans?" Seven response alternatives are available, ranging from "I do not plan to graduate from high school" to "I plan to enter a four-year college or university after high school." The index is coded on a five point scale: (1) no friends plan to attend college; (2) one friend plans to attend and two do not plan to attend; (3) one friend plans to attend and one does not plan to attend (used for respondents who listed only two friends); (4) two friends plan to attend and one does not plan to attend; and (5) all friends plan to attend college. Codes (1) and (5) can be used for respondents who listed only one friend, as well as for those who listed three friends.

This measure differs from the peer plans indices used in previous studies (e.g., Sewell and Hauser, 1975; Alexander and Eckland, 1974; 1975), which are derived from the student's reports of friends' educational intentions. Past research (McDill and Rigsby, 1973; Cook, 1976; Rigsby and McDill, 1972) suggests that the educational and occupational plans of the respondent will be more responsive to the "perceptual" measure than they will be to the "objective" index. Although the objective indices will be more accurate, it is not clear which variable is conceptually most appropriate to tap normative reference group pressures (see Sewell, Haller, and Portes, 1969; Hauser, personal communication).[4]

7. Student's educational expectations (EDEXP) are assessed by the same question used above to measure peer plans and are coded on a seven point scale.

8. Occupational expectations (OCCEXP) are based on students' responses to an open-ended question concerning the work they expect to do for most of their lives. The occupations were assigned Duncan's SEI scores.[5] Our measure of this dimension of ambition probably elicits greater realism from students than do the aspirational indices employed by Sewell and his colleagues and Alexander and Eckland (see the discussion in Kerckhoff, 1974). This is also suggested by Porter's (1974; 1976) findings which demonstrate that expectations are somewhat more strongly

linked to parental statuses than are aspirations.

Procedures

Our analyses will proceed in two stages. First, we will briefly compare our results for white males and white females to those obtained with three other data sets: the 1957 Wisconsin (WISC) seniors (Sewell and Hauser, 1975; Carter, 1972); the "Explorations in Equality of Opportunity" (EEO) data, which pertain to a national sample of 1955 sophomores (Alexander and Eckland, 1974; 1975; Alexander, Eckland, and Griffin, 1975); and McDill's "20 High School Climate" (CLIMATE) data (McDill and Rigsby, 1973) on tenth through twelfth graders samples in 1964-65. Since these three data sources pertain to the schooling experiences of high school students, we have selected tenth, eleventh, and twelfth grade white males and females for comparison purposes.[6] These comparisons necessarily will be somewhat crude because of differences in sample composition and measurement strategies. Moreover, we will have to compare standardized coefficients, a practice which may be misleading (Schoenberg, 1972; Blalock, 1967). At the same time, however, it will still be quite informative to compare the behavior of variables within models across data sets. This exercise should prove useful in assessing the applicability of the Wisconsin model to the educational processes of our white Mississippi students.

The second stage of the analysis will employ the entire Mississippi subsample of 8-12 graders. One of our primary purposes here is to assess systematically the importance of sex and race effects, both main and interaction, throughout the process of adolescent achievement and aspiration-formation. Accordingly, an analysis of covariance will be conducted via dummy variable regression to determine whether sex and race categories interact with the variables presented in Figure 1 (Fennessey, 1968; Gujarati, 1970; Miller and Erickson, 1974). The significance of the main and interaction race-sex effects will be evaluated by their unique contributions to the explained variation of each endogenous variable.

Several different sorts of covariance analyses were performed. We elected to present the following covariance results because of their ready interpretation and utility for comparison with past results. Race main and interaction effects will be assessed separately for each sex, while sex main and interaction effects will be evaluated separately for each race. Significant interactions imply that the regression slopes differ among groups. The meaning and importance of these interactions will be suggested by parallel analyses for each race-sex subsample.

Results

Due to considerations of space, the inter-item correlations will not be presented. Means and standard deviations for all variables for each group are presented in Table 1. We note that although blacks have lower levels of the "resources" associated with achievement and ambition (status origins, academic aptitude, and academic performance), their educational plans are slightly higher than those of whites and the occupational status expectations of black females are second only to those of white females. These results, therefore, conform to the data presented by other researchers on black-white similarities in career expectations and aspirations (Coleman, Campbell et al., 1966; Gordon, 1972; Porter, 1974; 1976; Hout and Morgan, 1975; Rosenberg and Simmons, 1972; Bachman, 1970). As Kerckhoff

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Table 1 here

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and Campbell (1975) have noted, relatively high goal orientations are unrealistic, especially given our knowledge concerning the actual attainment gaps of blacks relative to whites (see Duncan, 1969; Blau and Duncan, 1967; Treiman and Terrell, 1975; Porter, 1974; 1976; Blum and Coleman, 1970). We also note that the encouragement and influence received by black students from their significant others (parents, peers, teachers and counselors) are at least as

great as similar social-psychological supports received by white adolescents. Hout and Morgan (1975) report similar findings.

Table 2 presents estimates of the Wisconsin model separately by sex for four sets of white students. Some differences in the compositions of the samples are worthy of comment. Wisconsin (WISC) males are limited to those of non-farm origin, while MISS, EEO, and CLIMATE males and all four sets of females are of both farm and non-farm origin. The WISC sample is limited to Wisconsin seniors, the EEO data to a national sample of sophomores, and the MISS and CLIMATE data include 10-12 graders. The measurement of most variables differs from sample to sample, and to delineate these differences would consume far too much space. We will, however, briefly mention the more notable differences. GPA is self-reported in the EEO data and obtained from school records in the other sets. Parental encouragement (PAR) is limited to that from the mother in the CLIMATE sample. PEER plans are reported by the student in the EEO and WISC data and obtained from the students' friends in the MISS and CLIMATE data. OCCEXP represent expectations in the MISS sample and aspirations in the WISC and EEO data. The reader is referred to the original sources (reported above) for more information on the WISC, EEO, and CLIMATE sampling and measurement strategies.

We will not discuss Table 2 in any detail. It is

apparent that most of the coefficients are quite consistent for both males and females across data sets. More complex comparisons, such as patterns of indirect influence and estimates of total effects,[7] which have been made but not reported here, would serve to strengthen our general conclusion of similarity. Given the diversity in these studies in measurement procedures[8] and sampling designs, and the variation in schooling experiences represented by such sample differences, these findings are genuinely impressive. The Mississippi students, it should be remembered, were surveyed in 197? and were enrolled in schools quite different from those represented by the other data sources. The results for these students, in particular, provide very strong support for the enduring usefulness of the Wisconsin model of adolescent school performance for white high school students.

Table 2 here

Having first ascertained that the model is useful for understanding the dynamics of the early achievement process for white Mississippi high school students, we now examine race and sex main and interaction effects in the entire Mississippi 8-12 grade subsample. The results of the appropriate analyses of covariance are presented in Table 3. In panel I-A (labelled RACE EFFECTS-MALES), the first row presents the explained variance in the seven

endogenous variables for the male subsample. In the second row, the explained variance is presented after the race dummy variable is entered into each structural equation. The main effects (i.e., differences in intercepts) of race are evaluated by testing the significance of the increments to the explained variance. Finally row 3 contains the explained variation in each outcome after the further addition of the race interaction terms. Hence, a comparison of row 3 with row 2 will indicate whether the regression slopes between a particular endogenous variable and one or more predetermined variables differ between groups. The significance of all of these increments in explained variance is assessed by F tests (Cohen, 1968).

The interpretation of the remaining panels in Table 3 proceeds in exactly the same manner. Thus, in panel I-B, we evaluate race main and interaction effects within the female subsample, while in panels II-C and II-D, the consequences of the addition of sex and sex interactions to the structural equations are appraised for the white and black subsamples, respectively.

Consider first the male and female subsamples (panels I-A and I-B). Significant race main effects are obtained for all endogenous variables except GPA for males and for all endogenous variables for females. With the exception of APT, these main effects indicate that blacks have significantly larger intercepts in all equations than

Table 3 here

do whites (controlling for sex). There are three significant race interactions within the male subsample, for TEACH, EDEXP, and OCCEXP. Within the female subsample, significant interactions are evidenced for PAR and OCCEXP.

Let us now turn to the assessment of sex effects within the white subsample (panel II-C). Significant sex main effects are evidenced for all variables except TEACH and EDEXP. White females, when compared to their male counterparts, have significantly higher intercepts for APT, GPA, and OCCEXP. White males, on the other hand, have a larger intercept for parental encouragement (PAR). Significant sex interactions are obtained for TEACH, PAR, and OCCEXP.

Turning now to the evaluation of sex effects within the black subsample (panel II-D), only two significant sex main effects are observed. For both GPA and OCCEXP the intercepts for black women are higher. These "sex effects" are consistent with the results obtained with the white subsample. Only one endogenous variable, OCCEXP, is significantly affected by the sex interaction terms. The importance of all of these interactions will be discussed in conjunction with Table 4 and Table 5 below.

Although none of the interaction results are dramatic--the maximum increment to explained variance in

any endogenous variable is 2 percent--our interpretation of these covariance analyses is that both race and sex effects are consequential at a number of points in the Wisconsin model.[9] These data suggest, moreover, that sex effects, either main or interaction, are much more pronounced among whites than blacks. With only one exception (OCCEXP), the processes determining educational performance and aspiration-formation are very similar for all black adolescents. Race effects appear about equally important for both males and females. A more detailed examination of these race-sex effects, both additive and interactive, is presented in Table 4, which shows the metric and standardized estimates of the model depicted by Figure 1.

Table 4 here

We see first, that while academic aptitude (APT) is appreciably more determined by status origins among whites than among blacks, in all groups the overwhelming bulk of the variance in aptitude is orthogonal to socioeconomic background. These results are quite consistent with past findings (see Duncan, 1968).

The processes governing academic performance (GPA) are quite similar across groups. Between 25 and 30 percent of the variance in GPA is explained by socioeconomic origins and academic aptitude, and only the direct effect

of the latter variable is statistically or substantively important. Aptitude mediates most of the explanatory power of parental status and uniquely explains between 20 and 26 percent of the variance in academic performance in all groups. These results indicate that students of a given race and sex and of equal ability receive virtually the same evaluation of their academic performance, regardless of status origins. The consistently large aptitude effects and negligible SES influences across all race-sex groups are impressive and have been documented by other researchers (Sewell and Hauser, 1972; 1975; Alexander and Eckland, 1974; Hout and Morgan, 1975; Williams, 1972; Porter, 1974). We note, in passing, that the intercepts for females (both black and white) are larger than those of their male counterparts, suggesting that women are allocated somewhat higher course marks even independent of the other variables in the model. The positive consequences associated with "femaleness" for overall academic performance also have been reported by Alexander and McDill (1976), Alexander and Eckland (1974), and Hauser, Sewell, and Alwin (1974).

Moving now to the first "significant others' influence," counselor-teacher encouragement for higher education (TEACH), we see that the explained variance is very small, under 5 percent, for all groups. Academic performance registers significant, though small, salutary

effects for whites of both sexes. Moreover, white boys and girls convert this "resource" into encouragement from counselors and teachers at equal rates. Status influences, both total and net, generally are small; head's occupation (for white boys) and mother's education (for white girls), however, do modestly stimulate encouragement from school personnel. No coefficient is statistically or substantively important for black students of either sex. Finally, we note that the total effect of aptitude, not reported in this table, is quite small (beta is less than .09 in all groups). For a definition of total effect, see footnote 7.

Let us now turn to parental encouragement for higher education (PAR), the second source of interpersonal influence considered here. Parental encouragement, as perceived by the student, is much more sensitive to the status backgrounds, aptitude, and performance of whites (R^2 = .15 for both sexes) than blacks (R^2 = .05 and .08 for females and males, respectively). All variables except mother's education modestly enhance the (perceived) parental educational encouragement of white boys, and, for this subsample, no one variable is of overriding importance. Among white girls, however, the education of both parents is relatively more beneficial than academic performance, the only other variable exercising a significant direct effect. Comparing metric coefficients for

white boys and girls, we note that the salutary effects of parental education are much stronger for girls, while the enhancing benefit of head's occupation, aptitude and performance are larger for boys (for a similar finding among whites, see Alexander and Eckland, 1974).

These sex differences are not maintained for blacks, however. Black females translate aptitude into perceived parental encouragement more easily than black males. Indeed, the salutary effect of aptitude is even greater for black females than white males. There is, moreover, evidence that direct and total status effects, which are modestly significant for both sexes, are more pronounced for black males than black females. Another noteworthy racial difference is that, unlike the experiences of whites, parental encouragement is not dependent on the unmediated academic performance (GPA) of black students.

As has been the case with the other sources of support from significant others, the final interpersonal influence, (actual) educational plans of peers (PEER), is much more sensitive to the antecedent variables for whites than blacks. The R^2's are .15 and .09 for white males and females, respectively, and only .04 and .01 for black males and females.

Most of the variables in the white equations register significant but uniformly small salutary effects. The metric coefficients assessing the net import of aptitude

and performance are larger for white males than white females. Still within the white subsample, there is no notable sex difference in the net importance of status origins. Moving now to the black subsample, only head's occupation significantly enhances the likelihood of associating with college-oriented peers for black males, although the metric estimate of the importance of performance (GPA) is larger for black males than any other group. No coefficient, assessing either the total or direct influence of any variable, is significant (or substantively important) in the black female equation. The generally smaller coefficients in the black equations for all three significant others' influence is offset, to some degree, by the appreciably larger intercepts of blacks. However, these intercept differences, suggesting the unmediated positive consequences of being black, must be interpreted with extreme caution due to the interaction of race and the other variables in the model (Fennessey, 1968; Gujarati, 1970; Miller and Erickson, 1974). Thus, only when the independent variables have value of zero, a substantively implausible occurrence, will these intercept differences be observed.

Before concluding our discussion of the determinants of these interpersonal influences, we should note that for all groups the structural (direct) estimates of the composite SES effects are relatively more important than

either academic aptitude or school performance. These net effects, moreover, are generally almost as large as their corresponding reduced form estimates, or total effects (see Table 5). Status effects, therefore, on the actual or perceived support, encouragement or influence of significant others are not appreciably conditioned by the aptitude or performance of the student.

We now consider the ultimate endogenous variables, educational and occupational expectations. Consider first educational plans (EDEXP). The model appears reasonably successful in explaining variation in this outcome for whites, though this result is more pronounced for males (R^2 = .44) than females (R^2 = .38). The coefficients of determination are again considerably lower for blacks (R^2 = .24 for males and .19 for females).

With the exception of father's education and head's occupation, all variables significantly stimulate the educational expectations of both white males and white females. For whites of both sexes parental encouragement clearly exerts the greatest direct impact on plans, followed in importance by academic performance (males) or mother's education and peer plans (females). The remaining significant influences are small. In the formation of college plans, several notable white male-white female differences are evidenced; the net effect of performance is twice as important for males, while the direct influence

of mother's education and peer plans are appreciably larger for females. Once more, therefore, the greater saliency of status origins for white females and greater importance of academic aptitude or performance for white males is suggested (see also Alexander and Eckland, 1974; Sewell and Shah, 1967; 1968).

Again, however, this pattern appears to hold only for white students. Although black males more easily convert academic aptitude into concrete expectations than black females, the opposite is true for academic performance. Among blacks the net plans-performance coefficient is more than twice as large for girls. The direct effects of aptitude and all three indicators of interpersonal influence are significant for black boys, while only parental encouragement and performance significantly stimulate the educational plans of black girls. As is observed for their white counterparts, parental encouragement is, relatively, the most important influence on these plans for both black boys and girls. It is interesting to note that of the educational plans of the four groups considered here, those of black males are most sensitive to teacher-counselor and peer influences.

Turning now to occupational expectations (OCCEXP), we observe that the coefficients of determination, though lower, follow the same pattern as do those for educational expectations. That is, the model is most successful in

accounting for variation among white males (R^2 = .33) and least successful for black females (R^2 = .11). The coefficients obtained for white females (R^2 = .20) and black males (R^2 = .17) are reasonably similar and fall in between the extremes established by white males and black females.

Most of the variables in the structural equation significantly enhance the occupational expectations of white males, though their net effects are quite modest. Aptitude, performance, and two sources of interpersonal support, that from peers and parents, are important for the formation of the work-related plans of white females. With the exception of peer plans, the influence of all of these variables is stronger for white males than white females. The metric coefficients associated with academic aptitude and performance, for example, are almost twice as large for white boys.

Mother's education registers a direct salutary impact on the occupational plans of black males and females; the corresponding partial coefficients are much weaker for whites. Both black males and females convert academic performance into occupational status expectations at about the same rate as do white males and much more readily than do white females. Aptitude directly enhances the occupational plans of black males, though not of black females. Interestingly, the (net) metric coefficient associated with aptitude is larger for black men than any other group.

Parental encouragement (for females) and peer plans (for males) are the only other significant influences on this goal orientation for blacks. We note, finally, that the relatively high mean educational and occupational expectations of blacks (see Table 1) are due, to a considerable extent, not to the operation of the variables in this model but to the larger intercepts in the black (especially female) equations.

The addition of aptitude, performance, and the three types of significant others' influence to the EDEXP and OCCEXP equations mediates about half of the total impact of status origins for whites. Slightly less, about 40 percent, is so mediated for black students. However, the ambition of black students, as indexed by these two goal orientations, is much less determined by socioeconomic status origins than it is for white students. Racial differences in the SES-"ambition" linkage are the prime reason for the relative inability of the model to explain appreciable portions of the variance in educational and occupational plans of black students (see also the results presented in Table 5 below).

The results of the analysis of covariance, as well as the parameter estimates presented in Table 4, indicate that the absolute and relative import of status origins and academic aptitude and performance differs for white

males and females. The differential saliency of these variables for blacks and whites was also suggested by the above results. For the most part, however, we examined only the structural coefficients. In order to illuminate these important issues, we present the reduced-form estimates--or total effects--of SES, aptitude, and performance on teacher, parental, and peer influences and on educational and occupational expectations separately for each sex-race group. Only the summary SES composite coefficient is presented. Since SES is unmeasured we assigned SES the mean and standard deviation of the occupational plans variable of each race-sex group (for greater detail on this procedure see Hauser, 1973). These results are presented in Table 5.

Table 5 about here

Consider first white boys and girls. The metric coefficients, assessing the total impact of SES throughout the system, are higher for females than males for every outcome variable except occupational expectations. The male SES coefficients are, on the average, 26 percent smaller for the first four variables in column 1. Moreover, the reduced-form aptitude and performance coefficients are larger for males than females for all outcomes except teacher-counselor influence (which is of negligible importance). The male-female differences here average

36 (APT) and 40 (GPA) percent. We also note that the importance of academic aptitude and academic performance relative to that of SES is greater for males than females. These findings are quite consistent with those of Sewell and Shah (1967) and Alexander and Eckland (1974).[10] Compared to the educational supports and career expectations of white boys, those of white girls are more closely linked to their social origins; moreover, white girls cannot convert their academic aptitude or demonstrated past successes into these important social-psychological influences and orientations as readily as can white boys. Black females, however, do not share these particular liabilities associated with "femaleness," as Table 5 clearly demonstrates. Socioeconomic origins are considerably more important for black males than black females; nor does there appear to be a consistent sex bias in the social psychological "payoffs" to aptitude and performance among blacks.

Table 5 also shows that the significant others' influence and educational and occupational expectations of blacks are much less dependent on their beginning statuses than are similar supports and orientations of whites. Additionally, these racial differences maintain across both sexes. Our results suggest therefore that black families appear unable to transmit much of the advantages or disadvantages associated with their own achievements to

either their male or female offspring. This parallels the findings on the actual socioeconomic achievements of black and white men (Duncan, 1969; Blau and Duncan, 1967; Porter, 1974; Treiman and Terrell, 1975; Blum and Coleman, 1970).[11] Another racial difference of importance is that the educational influences on black students from teachers-counselors, parents, and peers are only trivially influenced by their academic aptitude and performance; this too is in contrast to the experiences of white boys and girls. Note, however, that standardized aptitude tests have greater consequences for the career expectations of black males than of white males, while school grades are more influential in the development of "ambition" of black girls than of white girls.[12]

The presence of interaction between race and one or more of the other variables in the model precludes a satisfactory assessment of the "main" effects of race. While several of the intercepts imply a positive consequence attached to being black, comparisons of intercepts require extreme caution. An alternative procedure for evaluating the "cost" (if any) of race can be made by substituting the mean values of the predetermined variables of whites, or the regression slopes from the white equations, into the equations for blacks (for greater detail on this procedure, see Duncan, 1969; Althauser and Wigler, 1972; Winsborough and Dickinson, 1971; Iams and Thornton,

1975). This yields an expected value for educational and occupational expectations based on one of two assumptions: (1) that blacks, on the average, have the same distributions as whites but convert these status, aptitude, and social-psychological resources into "ambition" at their own rate; or (2) that blacks convert ambition-related resources according to the estimated functions of whites but retain their own distributions for the explanatory variables. It must be emphasized that these "statistical experiments" or "hypothetical interventions" are interpretable only at the average values of all variables. If alternative values of the predictor variables were involved in the calculations, such as the minimum or maximum observed values, the technique would produce different expected values for educational and occupational expectations, as well as different estimates of the consequences of being black or white.

The results of a variety of "statistical experiments" are presented in Table 6. These computations strongly suggest that if black males and females had either (1) distributions on the explanatory variables identical to those observed for the "average" white or, especially, (2) a structure of achievement identical to whites (i.e., the same regression slopes) the career expectations and goal orientations of blacks would be substantially higher than actually observed and somewhat

higher than observed for whites. The increase in "ambition" within this sample of black adolescents ranges from a quarter to a full standard deviation, depending on the specific career expectation and substitution procedure employed. That black students have comparable levels of expected career outcomes as do white students should not be construed as a lack of discrimination in the schooling process or a paucity of societal forces working to the detriment of black students. Black adolescents develop and maintain high, though perhaps unrealistic aspirations and goal orientations in spite of their disadvantaged social origins and relative inability to convert their personal resources into important career motivations.

Discussion

The results presented in the paper strongly support the conclusions of the Wisconsin researchers and others concerning the dynamics of educational performance and ambition of white male and female students. Estimates of the parameters of the Wisconsin model for these white Mississippians were quite consistent with those obtained for white students enrolled in educational institutions of the 1950s and early 1960s. This replication, therefore, documents the continuing utility of the Wisconsin model of adolescent achievement. Moreover, our results also support past research findings on the pervasive influence of

sex throughout the early achievement process among white students (e.g., Hauser, Sewell, and Alwin, 1975; Alexander and Eckland, 1974; Sewell and Shah, 1967, 1968; Carter, 1972). While we have no direct data on sex differences in college enrollment, retention, and graduation, we can conclude that even as of 1972 consistent sex differences existed for white students in the manner in which social origins, aptitude, and academic performance facilitate or retard subsequent interpersonal and subjective schooling outcomes.

Our results also demonstrate the pronounced importance of race in the adolescent achievement process. Race main effects--almost invariably positive for blacks--were observed for every variable in the model, while race interactions were statistically significant for several outcomes and consequential for the interpretation of the estimates of all equations. The equations for blacks generally yield smaller regression coefficients, though blacks do have some significantly larger slopes which were discussed in the text. These generally smaller coefficients were reflected in appreciably lower coefficients of determination for all variables in the model for blacks except academic performance. Hence, the Wisconsin model yields poorer explanations of interpersonal influences and career expectations for blacks than it does for whites. This is consistent with the results of Porter (1974, 1976),

Hout and Morgan (1975), and Gordon (1972), all of which were derived from models similar to the one estimated in this paper. Clearly, then, supplementary variables, such as "achievement orientation," or "fate control," are necessary for a more complete understanding of how black students form their post-high school plans and expectations. Thus far, however, the explanatory power of such variables has not been particularly impressive (see Gordon's (1972) results with "self-esteem").

Race also intrudes in the interpretation of sex differences in this model. Although sex effects among white students are quite consequential, such effects, either main or interaction, generally are of negligible importance among black students. With the exception of occupational expectations, the processes determining these achievement-related outcomes are essentially similar for black males and females. Moreover, the consistent and pronounced sex differences among whites in the efficacy of status origins, academic aptitude and academic performance, so thoroughly documented by several researchers, do not exist for blacks. We can at this time only speculate on the reasons for the relative unimportance of "sex" among black students. Perhaps the experience of being a black high-school student transcends categorization by self and others as being either male or female. As (and if) the nature of the black student's participation and experience

in schools change, we may expect sex differences among black students to begin to parallel those which currently exist among white students.

Footnotes

[1]The Equality of Educational Opportunity data (Coleman, Campbell et al., 1966; Gordon, 1972) were collected in 1965; the McDill "20 High School" data (McDill and Rigsby, 1973; Alexander and McDill, 1976) in 1964-65; the Project Talent data (Porter, 1974, 1976); in 1960 and 1965; Williams's (1972, 1975) data on Canadian youth in 1959-60; the Wisconsin data (Sewell and Hauser, 1975) in 1957; the Davidson County-Nashville data used by Hauser (1972) in 1957; and the Explorations in Equality of Opportunity data (Alexander, Eckland, and Griffin, 1975; Alexander and Eckland, 1974, 1975), though collected (the second wave) in 1970, pertain to a 1955 cohort of high school sophomores. There are, of course, some exceptions to this general pattern (e.g., Kerckhoff and Campbell, 1975; Kerckhoff, 1974; Bachman, 1970; Hout and Morgan, 1975); however, with the exception of Hout and Morgan's Louisville, Kentucky, data, these data are limited to males.

[2]The coefficients assessing the impact of mental ability on the six variables following it in the model (see Figure 1), differ, on the average, from those presented in Table 4 by .031 for white males, .021 for white females, .026 for black males, and .042 for black females.

Most of these differences appear to be random, with the following exceptions: compared to mental ability, our academic aptitude measure slightly underestimates the influence of ability-aptitude on academic performance (GPA) for white males and black females and on educational and occupational expectations for black females. It must be remembered, however, that the use of the mental ability variable entailed a highly non-random loss of approximately 25 percent of the white subsample and 12 percent of the black subsample. Thus the small discrepancies noted above could quite easily result from differences in our subsamples.

[3]Some recent research (e.g., Peterson and DeBord, 1966; Hauser, 1972; Kerckhoff and Huff, 1974; Cook, 1976) suggests that student reports of parental encouragement are not entirely adequate substitutes for direct information elicited from parents.

[4]The pairwise present correlations between actual and student-reported peer plans are .44 (white males), .51 (white females), .23 (black females), and .31 (black males). Slightly higher correlations are reported for whites in Cook (1976).

5. Evidence on the utility of Duncan's SEI index for the occupational aspirations, expectations, or actual attainments of women is presented in Treiman and Terrell (1975) and Bose (1973). For a study employing prestige of

(prospective) husband's job as an index of female ambition see Turner (1964).

[6]Kerckhoff (1974) has suggested that the relationship among these adolescent achievement variables may differ by grade in school. In order to ascertain the homogeneity of regression slopes across grades in the MISS sample, an analysis of covariance was conducted separately for each race-sex group. For the 10-12 subsample of white boys and girls, no endogenous variable was significantly affected at the .01 level by the addition of grade interaction terms. For the entire 8-12 subsample, grade interactions were not significant (at the .01 level) for any outcome variable for black males and black females. Only TEACH was significantly influenced by the inclusion of the grade interaction terms for white males, while GPA, TEACH, and OCCEXP were so affected for white females. However, an inspection of all regression coefficients at each grade level indicated no meaningful pattern across grades. Additionally, the incremental explained variance was small and very few specific interaction terms were significant. Of the 32 interaction terms involving grade in the OCCEXP equation for white females, for example, only two were significant at the .05 level. Because of the general nonsignificance of the interaction effects, their extremely modest statistical importance, and their apparent randomness, we ignore grade interactions in this paper and rely

on the pooled (i.e., common) within grade regression slopes.

[7]The total effect is defined as the sum of the direct (net) and "nonspurious" indirect effects. The latter are effects which are mediated by intervening, rather than antecedent, variables (Finney, 1972; Lewis-Beck, 1974; Alwin and Hauser, 1975). Throughout the remainder of this paper we will occasionally refer to "total effects" but only in Table 5 are such effects presented.

[8]Differences in measurement techniques may account for at least one of the discrepancies observed for males in Table 2. Had we substituted perceived for actual peer plans in the MISS sample the path from PEER to EDEXP would have been .213 rather than .144 (as reported in Table 2). A similar substitution in the OCCEXP equation would have increased the estimate of PEER influences from .105 to .140. These revised estimates are closer to those obtained with the WISC and EEO data, both of which also employ perceived peer plans.

[9]Although these race and sex interactions make only modest unique contributions to the explained variance in the endogenous variables, they are very consequential for interpreting the estimates of the model, as Table 4 demonstrates. Moreover, as Alexander and Eckland (1974: 674) note, "This is a conservative procedure for assessing

the sex (or race) effects, since the joint explanatory power of sex (or race) covariance with other predictor variables is included in the 'sex (or race) free' equations." (See also the discussion in Werts and Link, 1971.)

[10]These percentage differences in the sizes of the SES and aptitude coefficients are very similar to those observed in the EEO data (see Alexander and Eckland, 1974). For further evidence on sex-SES and sex-aptitude interactions, see Hauser (1972) and Williams (1972, 1975).

[11]Two other interpretations of these racial differences are possible: (1) some evidence suggests that black adolescents report parental status characteristics less reliably than do white adolescents (St. John, 1970; Kerckhoff, Mason, and Poss, 1973) and, therefore, the regression slopes are relatively more attenuated for blacks. While plausible, we lack the reliability and validity data on status-origin variables necessary to explore this hypothesis; and (2) socioeconomic origin variables other than parental education and occupation may be influential in the determination of educational performance ambition of black students. Such variables could include parental income, wealth or possessions, life-style, or local community prestige and status. Again, such data are not available to us.

[12]Our reanalysis of the Project Talent data for black and white men presented in Porter (1974) supports

most of these conclusions for men. The metric coefficients assessing the impact of head's occupation, aptitude, and academic performance on "significant others' influence" is larger for white males, while performance is significantly more important for the formation of occupational plans among black men.

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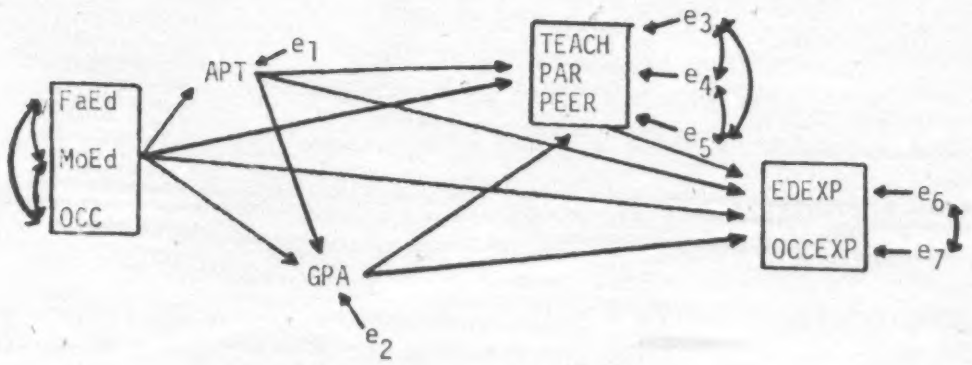

FIGURE 1--The Wisconsin Model of Adolescent Achievement

For ease of presentation certain variables in the diagram have been "blocked" together; in the actual structural model and analysis, however, the separate variables operate upon one another as diagrammed. The sources for the Wisconsin model evaluated here are Sewell and Hauser(1972,1975). Variable abbreviations are:

FaEd, father's education
MoEd, mother' education
OCC, head's occupation
APT, academic aptitude
GPA, grade point average (academic performance)
TEACH, teacher encouragement
PAR, parental encouragement
PEER, peer educational plans
EDEXP, educational expectations
OCCEXP, occupational expectations

Table 1

Means and Standard Deviations by Race and Sex*

Variable	White Males (N=1014)	White Females (N=1025)	Black Males (N-439)	Black Females (N=550)
FaEd $\bar{X}$	2.97	2.87	2.05	1.90
S.D.	1.43	1.39	1.29	1.09
MoEd $\bar{X}$	2.91	2.77	2.30	2.19
S.D.	1.18	1.16	1.22	1.16
OCC $\bar{X}$	41.48	40.86	25.18	22.15
S.D.	22.98	23.16	17.54	15.53
APT $\bar{X}$	7.05	7.19	4.05	4.10
S.D.	2.61	2.43	2.26	2.10
GPA $\bar{X}$	3.23	3.63	2.72	2.91
S.D.	.88	.85	.71	.73
TEACH $\bar{X}$	3.42	3.40	3.58	3.52
S.D.	.68	.63	.78	.77
PAR $\bar{X}$	7.57	7.21	7.46	7.45
S.D.	1.86	1.90	1.83	1.73
PEER $\bar{X}$	4.25	4.12	4.29	4.29
S.D.	1.24	1.34	1.18	1.20
EDEXP $\bar{X}$	5.23	5.08	5.41	5.28
S.D.	1.75	1.74	1.70	1.70
OCCEXP $\bar{X}$	52.01	55.65	46.88	53.86
S.D.	28.10	19.95	25.48	21.85

*See note to Figure 1 for variable abbreviations.

Table 2

Standardized Structural Estimates for Four Data Sets

Data Set		Predetermined Variables									
		FaEd	MoEd	OCC	"SES"	APT	GPA	TEACH	PAR	PEER	R^2
						White Males[1]					
MISS	APT	.039	.193*	.142*	.316						.100
WISC		.158*	.099*	.083*	.272						.074
EEO		.276*	.026	.077	.332						.110
CLIM		.109*	.048	.159*	.270						.073
MISS	GPA	.054	.011	-.012	.055	.460*					.227
WISC		-.004	.022	.027	.037	.549*					.312
EEO		.081	-.027	.017	.078	.460*					.241
CLIM		.166*	-.009	.082	.222	.248*					.139
MISS	TEACH	-.102	.043	.184*	.159	-.040	-.228*				.075
WISC		.015	.038	.068*	.096	.147*	.317*				.200
EEO		.023	.109*	.094*	.178	-.038	.229*				.088
CLIM		.118*	.014	.001	.127	.030	.172*				.063
MISS	PAR	.059	.061	.167*	.246	.109*	.144*				.137
WISC		.060*	.094*	.151*	.236	.191*	.166*				.194
EEO		.020	.130*	.208*	.287	.039	.278*				.205
CLIM		.142*	.134*	.070	.288	.094*	.120*				.146
MISS	PEER	.098	.005	.170*	.238	.180*	.072				.136
WISC		.087*	.081*	.110*	.217	.117*	.203*				.158
EEO		.024	.147*	.178*	.276	.072	.216*				.174
CLIM		.102*	.067	.126*	.246	.096	.278*				.214
MISS	EDEXP	.088	.134*	.063	.242	.110*	.164*	.152*	.290*	.144*	.461
WISC		.025	.056*	.061*	.110	.105*	.166*	.132*	.245*	.238*	.462
EEO		.060	.068	.054	.143	.072	.152*	.046	.245*	.295*	.438
CLIM		-.052	.069	.025	.063	.046	.118*	.052	.287*	.253*	.492
MISS	OCCEXP	.024	.085	.188*	.256	.098*	.149*	.178*	.146*	.105*	.325
WISC		.037	.032	.051*	.094	.122*	.205*	.086*	.218*	.215*	.411
EEO		.034	-.018	.217*	.214	.089*	.171*	.045	.168*	.157*	.300
CLIM						--NA--					

*Indicates coefficients at least twice their standard errors.

[1]The sample sizes are MISS (N=555, Grades 10-12), WISC (N=1789), EEO (N-618), CLIM (N=754).

Table 2 (continued)

Data Set		Predetermined Variables									
		FaEd	MoEd	OCC	"SES"	APT	GPA	TEACH	PAR	PEER	R^2
						White Females[2]					
MISS	APT	.229*	.100	.128*	.389						.151
WISC		.117*	.176*	.076	.299						.089
EEO		.098*	.126*	.128*	.286						.082
CLIM		.087	.090	.071	.207						.043
MISS	GPA	.006	.028	.003	.034	.456*					.219
WISC		.039	.085*	-.047	.087	.624*					.425
EEO		.072	.006	.039	.104	.469*					.257
CLIM		.058	.055	.134*	.210	.349*					.195
MISS	TEACH	.057	.111*	.004	.156	-.038	.236*				.083
WISC		.155*	.049	-.046	.165	.016	.383*				.211
EEO		.078*	.078	.011	.144	-.014	.148*				.049
CLIM		.053	.035	.112*	.172	.055	.059				.048
MISS	PAR	.225*	.184*	.028	.386	.006	.065				.166
WISC		.098*	.161*	.112*	.296	.120*	.162*				.200
EEO		.104*	.126*	.105*	.277	.010	.213*				.151
CLIM		.138*	.141*	.075	.298	.111*	.075				.139
MISS	PEER	.129*	.115*	.087	.278	.084	-.009				.101
WISC		.215*	.080*	.071	.307	.098*	.179*				.202
EEO		.167*	.185*	.146*	.410	.049	.182*				.254
CLIM		.118*	.144*	.073	.281	.107*	.238*				.215
MISS	EDEXP	.068	.155*	.019	.215	.045	.081*	.168*	.335*	.160*	.416
WISC		.103*	.113*	.039	.209	.011	.119*	.072*	.350*	.125*	.413
EEO		.061*	.108*	.099*	.226	.034	.090*	-.011	.233*	.369*	.456
CLIM		-.051	.069	.025	.061	.047	.118*	.052	.287*	.253*	.492
MISS	OCCEXP	.034	.028	.073	.114	.098*	.054	.121*	.206*	.110*	.187
WISC		.088*	.073*	.054	.173	.040	.194*	.054	.247*	.063	.299
EEO						--NA--					
CLIM						--NA--					

*Indicates coefficients at least twice their standard errors.

[2]The sample sizes are MISS (N=521, 10-12 grade), WISC (N=730), EEO (N-854), CLIM (N-663).

Table 3

Sex and Race Effects in the Wisconsin Model

	Dependent Variable Explained Variance						
	APT	GPA	TEACH	PAR	PEER	EDEXP	OCCEXP
I. Race Effects							
(A) Males (n=1453)							
(1) Total model	.2156	.3194	.0223	.1106	.0892	.3487	.2740
(2) Total model, race	.3352*	.3200	.0386*	.1256*	.1183*	.3773*	.2832*
(3) Total model, race, race interactions	.3372	.3232	.0468*	.1304	.1221	.3865*	.2938*
(B) Females (n=1575)							
(1) Total model	.2333	.3950	.0125	.0802	.0354	.2918	.1510
(2) Total model, race	.3763*	.3988*	.0295*	.1145*	.0622*	.3113*	.1596*
(3) Total model, race, race interactions	.3788	.4020	.0358	.1222*	.0679	.3170	.1691*
II. Sex Effects							
(C) Whites (n=2039)							
(1) Total model	.1497	.2809	.0385	.1372	.1137	.4081	.2642
(2) Total model, sex	.1517*	.3286*	.0401	.1498*	.1166*	.4089	.2684*
(3) Total model, sex, sex interactions	.1539	.3294	.0481*	.1586*	.1194	.4131	.2905*
(D) Blacks (n=989)							
(1) Total model	.0745	.2479	.0046	.0568	.0230	.2020	.1266
(2) Total model, sex	.0756	.2627*	.0061	.0569	.0230	.2037	.1439*
(3) Total model, sex, sex interactions	.0759	.2640	.0123	.0620	.0254	.2128	.1632*

*Effect is significant at $p < .05$.

Table 4

Estimates of the Wisconsin Model for Mississippi 8-12 Grade Students

Dependent Variables		Predetermined Variables										
		FaEd	MoEd	OCC	"SES"	APT	GPA	TEACH	PAR	PEER	R^2	CONSTANT
		Metric Coefficients										
APT	WM	.12212	.441.81*	.02241*								4.47324
	WF	.32880*	.29701*	.01301*								4.89282
	BM	-.09181	.34935*	.02117*								2.75615
	BF	.05215	.30428*	.01821*								2.93217
GPA	WM	.04419	.01977	.00017		.16521*						1.86525
	WF	.02813	.02677	-.00074		.18411*						2.18443
	BM	-.04707	.02992	.00109		.15351*						2.10065
	BF	-.05436	.00474	.00251		.17330*						2.23662
TEACH	WM	-.01625	-.02214	.00607*		-.00471	.09127*					3.01792
	WF	.01910	.05455*	.00069		-.00209	.10029*					2.81541
	BM	-.02832	.07767	.00148		-.03899	.05970					3.41397
	BF	-.00639	.03043	-.00235		.01905	-.01140					3.47061
PAR	WM	.13337*	.04341	.01325*		.06687*	.31625*					5.01004
	WF	.25169*	.29283*	-.00009		.02634	.23808*					4.62336
	BM	.04182	.28829*	.00675		.04763	.12802					5.99743
	BF	.16025*	.13137	.00013		.09862*	-.11909					6.79920
PEER	WM	.09287*	.05605	.00768*		.07723*	.09806*					2.63412
	WF	.11612*	.11563*	.00284		.05103*	.04899					2.80583
	BM	.08433	-.03178	.00727*		.03925	.10614					3.56298
	BF	.05134	-.00226	.00313		.03339	.00550					3.96512
EDEXP	WM	.07867	.16578*	.00467		.05248*	.38480*	.27512*	.33082*	.11960*		-1.24428
	WF	.02921	.25798*	.00158		.05410*	.19500*	.29658*	.29646*	.22308*		-.94991
	BM	.13375	.04912	-.00394		.13482*	.15132	.35668*	.20823*	.23935*		.30979
	BF	.04416	.11646	.00526		.04322	.38704*	.15239	.27866*	.10154		.47671
OCCEXP	WM	1.18187	1.38821	.17405*		1.83683*	4.63702*	4.56198*	2.84854*	1.04590		-32.28827
	WF	1.10123	.74404	.03441		1.04422*	2.84841*	1.32446	1.57173*	2.02280*		6.99452
	BM	-.89874	2.51227*	-.00180		2.47653*	4.17679*	2.59995	1.11296	2.95664*		-8.71620
	BF	.55207	1.86011*	.02989		.51890	4.85727*	-.47999	2.65010*	-.76478		17.01939

Table 4 (continued)

Dependent Variables		Predetermined Variables										
		FaEd	MoEd	OCC	"SES"	APT	GPA	TEACH	PAR	PEER	R^2	CONSTANT
		Standardized Coefficients										
APT	WM	.067	.200*	.197*	.394						.154	
	WF	.189*	.142*	.124*	.390						.152	
	BM	-.011	.189*	.164*	.290						.084	
	BF	.027	.167*	.134*	.261						.068	
GPA	WM	.071	.026	.004	.093	.488*					.279	
	WF	.046	.037	-.020	.065	.528*					.307	
	BM	-.085	.051	.027	.067	.486*					.245	
	BF	-.082	.009	.054	.076	.502*					.257	
TEACH	WM	-.034	-.039	.205*	.174	-.018	.119*				.048	
	WF	.042	.100*	.025	.147	-.008	.134*				.048	
	BM	-.047	.121	.033	.114	-.112	.054				.018	
	BF	-.009	.046	-.047	.055	.052	-.011				.005	
PAR	WM	.102*	.028	.163*	.257	.094*	.150*				.150	
	WF	.184*	.179*	-.001	.329	.034	.106*				.151	
	BM	.029	.192*	.065	.246	.059	.050				.081	
	BF	.101*	.088	.001	.163	.120*	-.050				.045	
PEER	WM	.107*	.053	.142*	.260	.162*	.070*				.152	
	WF	.120*	.100*	.049	.233	.092*	.031				.088	
	BM	.092	-.033	.108*	.152	.075	.064				.044	
	BF	.047	-.002	.041	.073	.059	.003				.011	
EDEXP	WM	.064	.112*	.061	.203	.078*	.194*	.106*	.351*	.085*	.443	
	WF	.023	.172*	.021	.200	.075*	.095*	.108*	.324*	.172*	.381	
	BM	.101	.035	-.041	.113	.179*	.063	.164*	.224*	.166*	.244	
	BF	.028	.079	.048	.122	.053	.165*	.069	.282*	.071	.186	
OCCEXP	WM	.060	.058	.142*	.224	.171*	.146*	.110*	.189*	.046	.329	
	WF	.077	.043	.040	.138	.127*	.121*	.042	.150*	.136*	.202	
	BM	-.045	.121*	-.001	.100	.220*	.117*	.080	.080	.137*	.174	
	BF	.028	.099*	.021	.124	.050	.162*	-.017	.209*	-.042	.114	

*Indicates b's twice their standard error.

See Figure 1 for variable labels. WM = white males; WF = white females; BM = black males; BF = black females.

Table 5

Reduced Form Estimates by Race and Sex*

	White Males (N=1014)			White Females (N-1025)			Black Males (N-439)			Black Females (N=550)		
	SES	APT	GPA	SES	APT	GPA	SES	APT	GPA	SES	APT	GPA
TEACH	.190 (.0046)	.040 (.0104)	.119 (.0913)	.179 (.0057)	.063 (.0164)	.134 (.1003)	.095 (.0029)	-.086 (-.0298)	.054 (.0597)	.056 (.0019)	.047 (.0171)	-.011 (-.0114)
PAR	.332 (.0220)	.167 (.1191)	.150 (.3163)	.370 (.0352)	.090 (.0702)	.106 (.2381)	.270 (.0194)	.083 (.0673)	.050).1280)	.187 (.0148)	.095 (.0780)	-.050 (-.1191)
PEER	.341 (.0150)	.196 (.0934)	.070 (.0981)	.277 (.0186)	.109 (.0600)	.031 (.0490)	.176 (.0126)	.107 (.0555)	.064 (.1061)	.084 (.0115)	.060 (.0343)	.003 (.0055)
EDEXP	.442 (.0275)	.252 (.1695)	.265 (.5263)	.434 (.0379)	.180 (.1291)	.149 (.3063)	.241 (.0161)	.232 (.1747)	.094 (.2247)	.210 (.0163)	.171 (.1381)	.150 (.3527)
OCCEXP	.424 (.4240)	.287 (3.087)	.190 (6.057)	.319 (.3190)	.222 (1.822)	.146 (3.455)	.214 (.2140)	.291 (3.279)	.134 (4.788)	.187 (.1870)	.148 (1.533)	.151 (4.543)

*Metric coefficients in parentheses.

Table 6

Expected Values for Educational and Occupational Expectations for Black Males and Females, Given White Means or Slopes

	$\bar{X}$	σ
Educational Expectations — Black Males		
(1) Observed Mean	5.41	(1.7)
(2) Expected: Black Male Slopes, White Male Means	6.27	
(2) compared to (1)	+.86	
(3) Expected: White Male Slopes, Black Males Means	6.20	
(3) compared to (1)	+.79	
Occupational Expectations		
(1) Observed Mean	46.88	(25.48)
(2) Expected: Black Male Slopes, White Male Means	56.68	
(2) compared to (1)	+9.8	
(3) Expected: White Male Slopes, Black Male Means	63.40	
(3) compared to (1)	+16.52	
Educational Expectations — Black Females		
(1) Observed Mean	5.28	(1.7)
(2) Expected: Black Female Slopes, White Female Means	5.80	
(2) compared to (1)	+.52	
(3) Expected: White Female Slopes, Black Female Means	6.13	
(3) compared to (1)	+.85	
(4) Expected: White Male Slopes, Black Female Means	6.37	
(4) compared to (1)	+1.09	
Occupational Expectations		
(1) Observed Mean	53.86	(21.85)
(2) Expected: Black Female Slopes, White Female Means	61.86	
(2) compared to (1)	+8.0	
(3) Expected: White Female Slopes, Black Female Means	59.10	
(3) compared to (1)	5.24	
(4) Expected: White Male Slopes, Black Female Means	88.90	
(4) compared to (1)	+25.04	